

DCC Overview

What is DCC

DCC is a way to control Locomotives and other things.

NMRA standards ensure everything DCC works together.

NCE works with Digitrax works with BLI works with Atlas etc.

NMRA awards conformance warrants for DCC systems that pass tests.

You can mix and match almost any DCC equipment without issues.

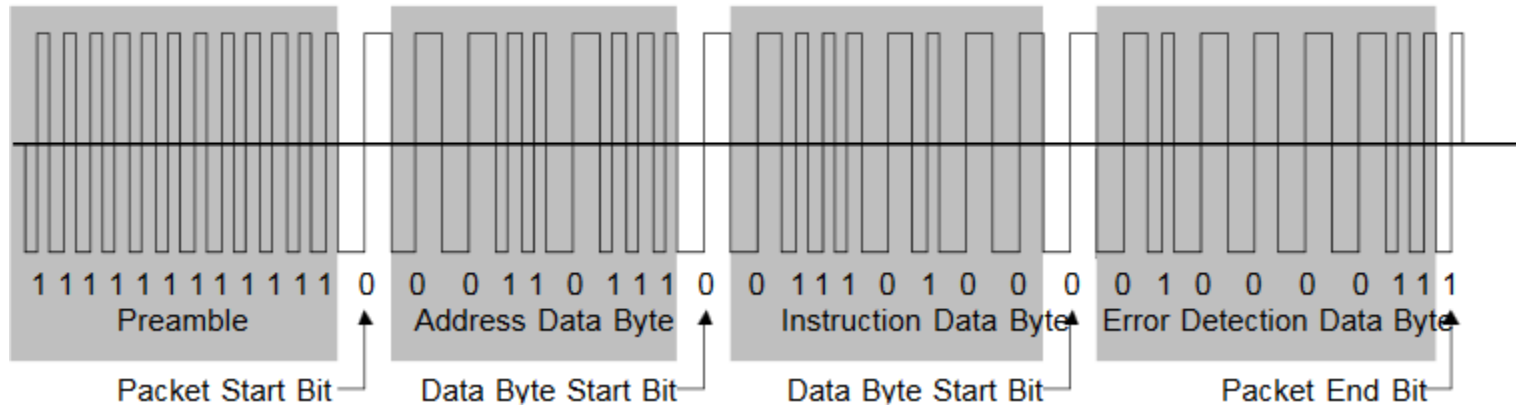
What uses DCC

The same wires can be used to control anything that accepts DCC commands.

- Locomotives
- Switch controls
- Block detectors
- Signals
- Other stuff

How it works

Figure 1 provides an example of an acceptable command control packet that uses three data bytes: one address data byte, one instruction data byte and one error detection data byte.



This is lifted from the NMRA DCC RP page. It has a start, address, data, and checksum. This is a command for Loco #55. These data packets are broadcast over the rails constantly. Notice, one address byte, so this is a short address.

Speed Command Packet

Speed and Direction Packet For Locomotive Decoders

111111111111 0 0AAAAAAA 0 01DCSSSS 0 EEEEEEEE 1
Preamble Byte One Byte Two Byte Three (Error Detection Data Byte)

CS ₃ S ₂ S ₁ S ₀	Speed	CS ₃ S ₂ S ₁ S ₀	Speed	CS ₃ S ₂ S ₁ S ₀	Speed	CS ₃ S ₂ S ₁ S ₀	Speed
00000	Stop	00100	Step 5	01000	Step 13	01100	Step 21
10000	Stop (I)	10100	Step 6	11000	Step 14	11100	Step 22
00001	E-Stop*	00101	Step 7	01001	Step 15	01101	Step 23
10001	E-Stop* (I)	10101	Step 8	11001	Step 16	11101	Step 24
00010	Step 1	00110	Step 9	01010	Step 17	01110	Step 25
10010	Step 2	10110	Step 10	11010	Step 18	11110	Step 26
00011	Step 3	00111	Step 11	01011	Step 19	01111	Step 27
10011	Step 4	10111	Step 12	11011	Step 20	11111	Step 28

Speed packet data format. Byte one is address. AAAAAA is the address, up to 127.
(Different packet format for long address.)

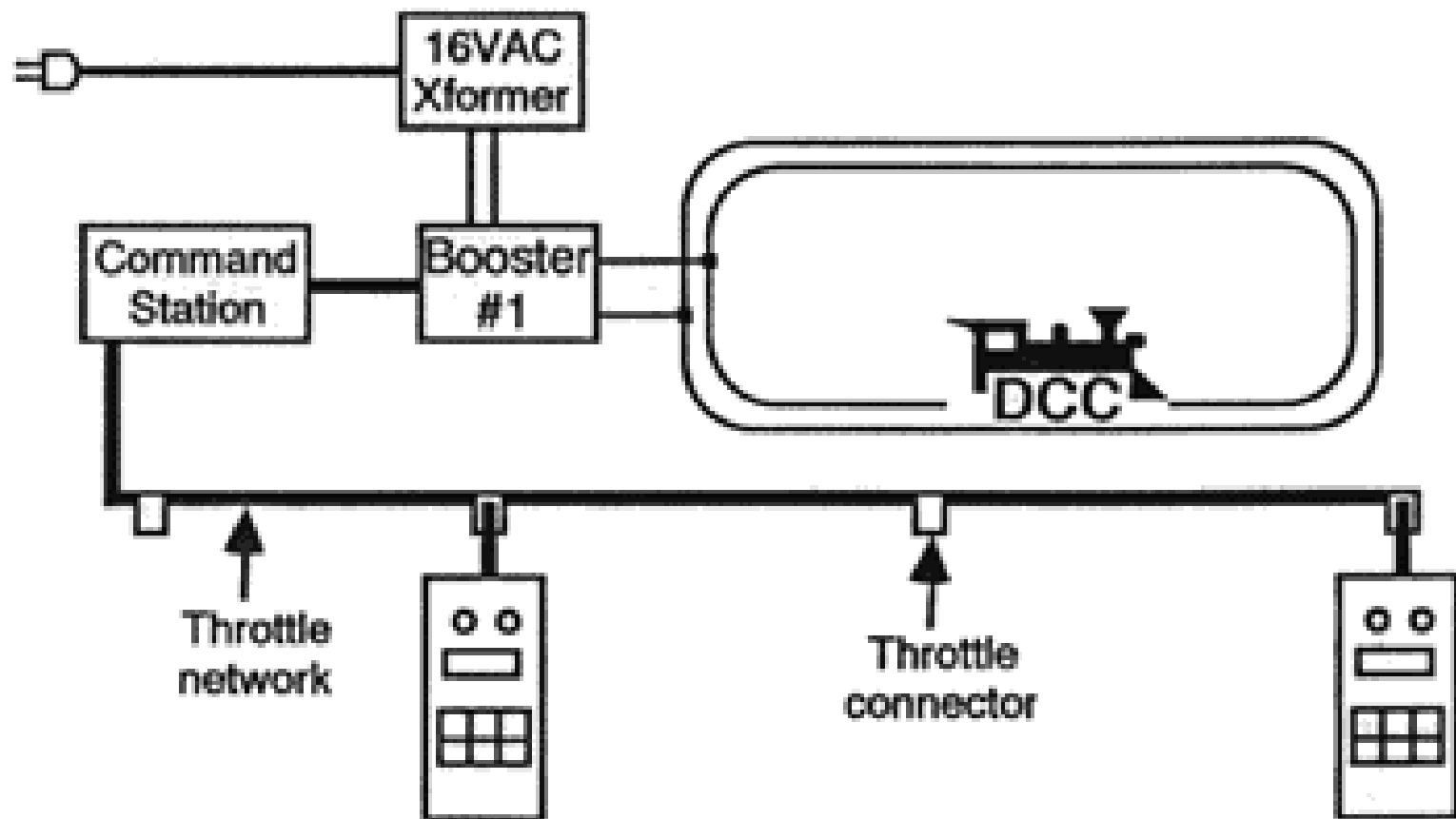
Byte 2 is speed and direction. D is 1 for forward, 0 for reverse. CSSSS is the speed step or stop. (In 14 step systems, C is light command.)

Systems

The following is an overview of the available DCC systems in common use in this area, (Texas).

For a larger list of systems, check out JMRI in the hardware supported page.

Generic DCC wiring diagram



Accessories

Lots of things to add to a starter system

Throttles Sensors

Switch controllers or Accessory Controllers

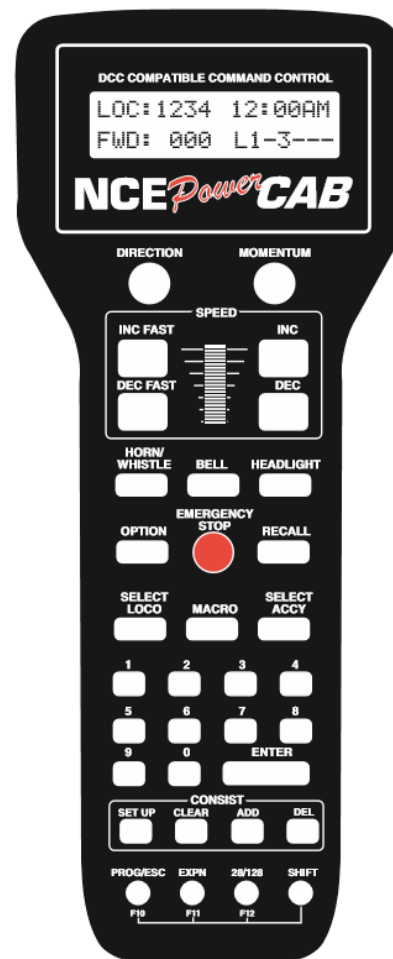
Wiring Access points

Wireless Transmitters

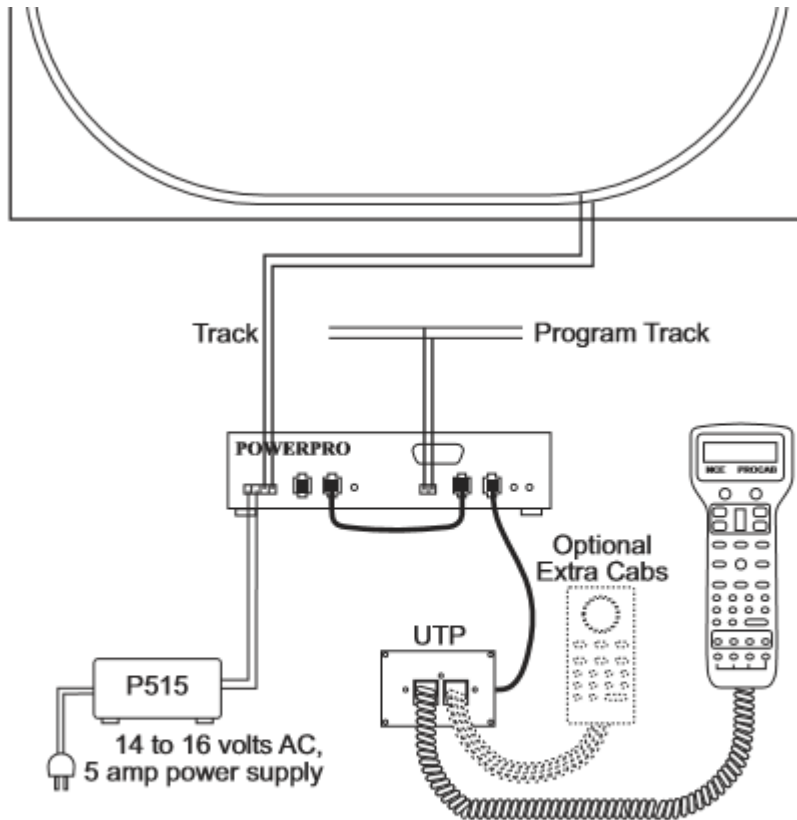
Wireless Throttles or Smart Phones

NCE Power Cab

THE POWER CAB™



NCE Power Pro



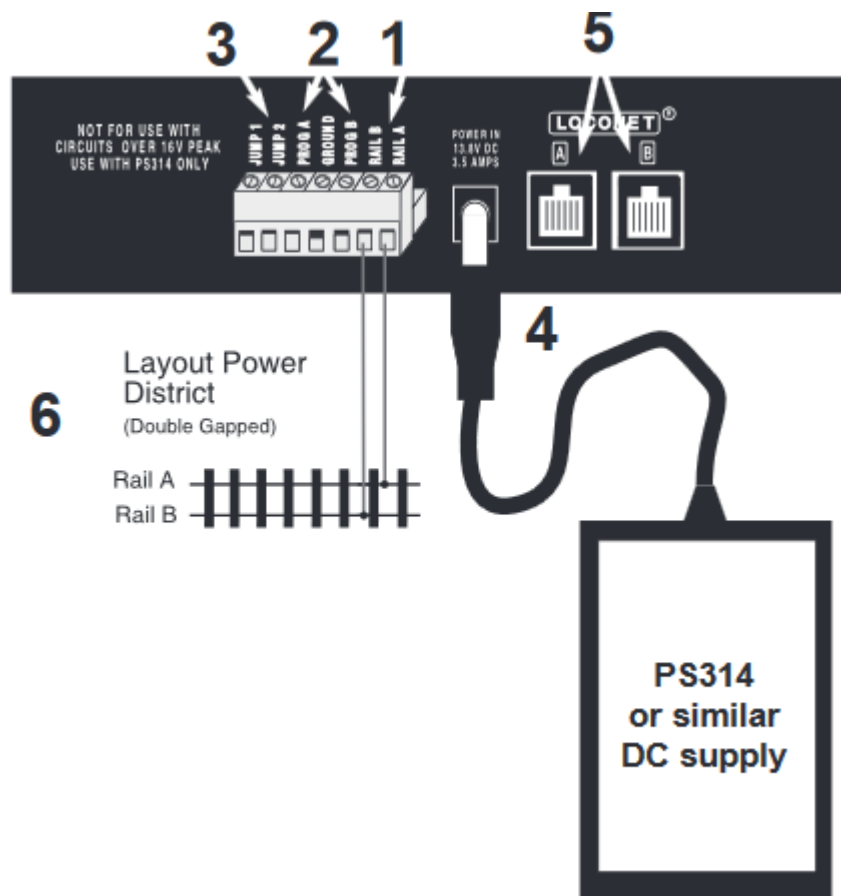
**BASIC SET UP OF 5 AMP
POWER PRO SYSTEM**

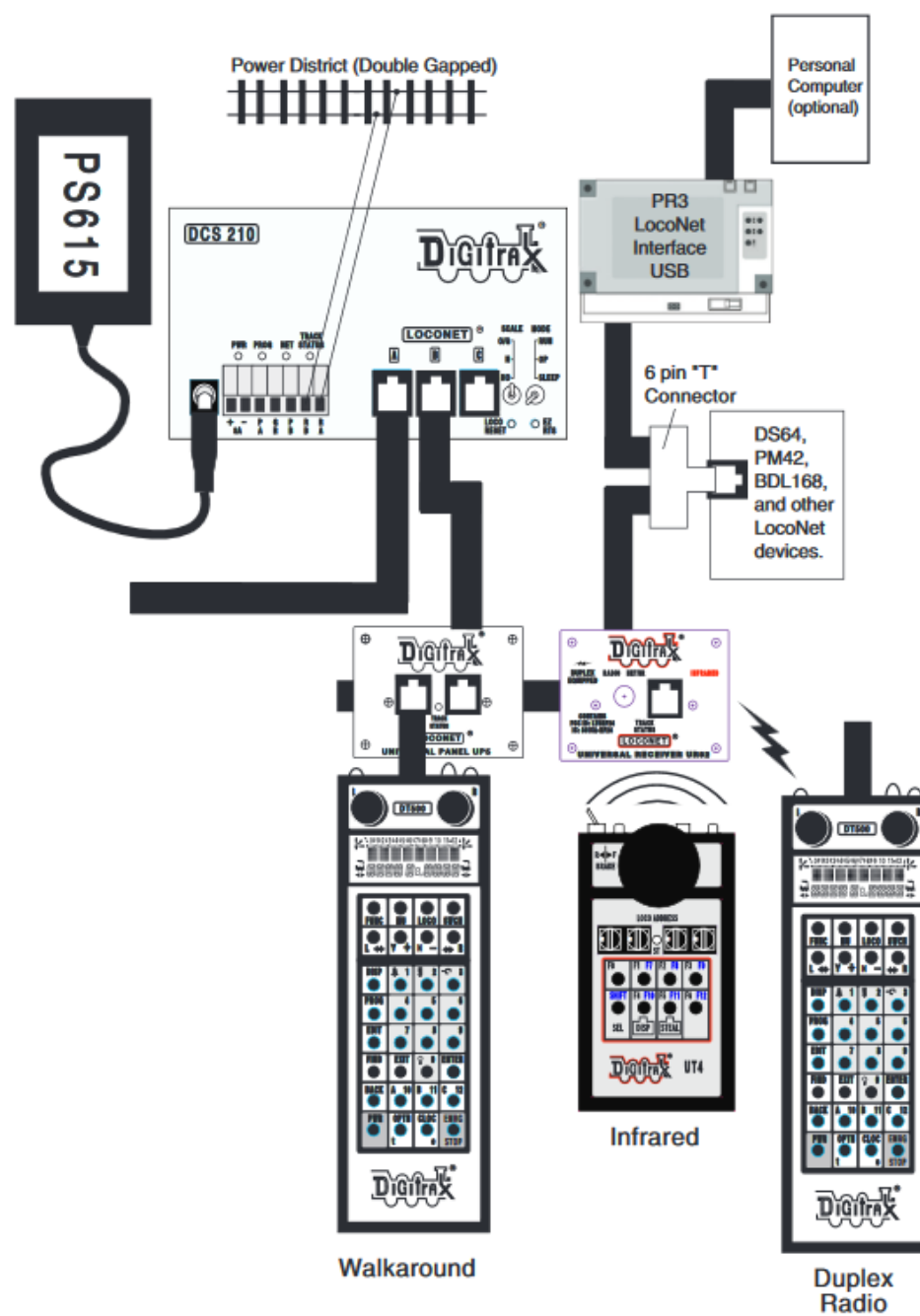


Digitrax



Digitrax Zephyr Connections





SPROG

SPROG

Simplest system to set up.

- 2 track wires
- 2 wires from power pack
- USB interface cable
- Does require computer with JMRI to run
- Supports JMRI WiFi Throttles



Other Systems

Easy DCC – common in the area but obsolete

Linz – Very good system, mainly in Europe (Became DCC)

ESU – Best system, most features, highest price, mostly in EU

MRC – Tempting, but fewer features.

MTH DSS– Not NMRA system, started as O_Scale system for Lionel.

About 50 other systems.

Which one is for me?

Price – SPROG or DIY Raspberry PI, <\$100

Small Layout – SPROG 3, NCE or Zephyr.

Large Layout – Digitrax, Lenz or ESU depending on budget.

What do your friends have? Easier to find help.

Which one part 2

How technical are you?

Computers give you hives? Zephyr

Your VCR will start your Coffey maker? Raspberry Pi DIY setup.

You like JMRI? SPROG (With boosters)

You want to automate your railroad? Digitrax (Not Zephyr)

Last point

What works for you is wrong for me.

Make your own list.

- Do you want a Knob?
- Do cellphones work as throttle? (JMRI connection)
- Cost
- Can you understand the manual?
- Other Features
- Feedback from friends or NMRA members. (Go look at a system!)